The New Dutch Waterline

The (Hi)story of the Landscape

Delft University of Technology
AR2A011

Sjimmie de Jong
4882946

Colophon

Sjimmie de Jong
4882946
Architectural History thesis

Delft University of Technology
AR2A011

Tutor: Marie-Thérèse van Thoor

Content

Abstract - This thesis is written after reviewing the UNESCO nomination report for the New Dutch Waterline (NDW). in the report and other literature regarding the NDW there is a very dominant blind spot regarding the vegetation and its historical value. This thesis tries to albeit in a modest way address this gap in the literature by setting the first steps of doing an analysis trying to answer the question: what is the historical value of the vegetation around fort Rhijnauwen. To arrive at a complete understanding of the landscape, the vegetation and being able to interpret these, the research will introduce the term genius loci as described by Schulz. After this the thesis will start on the general aspects of the NDW, zooming in per chapter on the topic of vegetation and the specific case study fort Rhijnauwen. The conclusion is that many of the described stages of history are upon closer inspection indeed readable in the landscape of the case study, giving it historic significance, the depth of the analysis however is limited and further or more detailed research could lead to an even better understanding of the landscape.

Introduction

The New Dutch waterline or NDW has recently been appointed as UNESCO world heritage, it is the culmination of years of work since it got nominated in 2011.[1] Upon investigation of the report that was compiled for this successful nomination one only needs to look at the contents to discover that the landscape was not the main focus of the nomination,[2] upon further inspection of the report one finds that the landscape has only been addressed in a minimal understanding of the word. Addressing the typical landscapes that surround the NDW and how these landscapes characterized military development, the description of the defense line is continued by sub dividing these landscapes by means of characteristics, to summarize the descriptions there are three categories: Strategic deployed landscape, water management systems and military fortifications. The landscape of the NDW has more components than its use of water, morphological- and geological-structure. Going through the report one is smothered by lush green images while vegetation is only briefly discussed in the most basic and general way.[3] Thus, one can conclude that the reports mainly aims to describe the military fortifications, and the workings of water as a defensive system, to give context to historic development the landscape has been addressed too, what seems lacking is the analysis of the historic value of the planting covering the NDW. This is also the case for other literature found about the defense line, the most notable book is Sterk water by Chris will, [4] it offers a very complete overview of the history, of the defense line, its inner workings and the end the water line during the Second World War. Most articles found are written from a military heritage perspective, or focus on revitalization where the narrative chosen is often water for obvious reasons. The most notable author on vegetation around the NDW is Martijn Boosten, and besides some articles the book: beplanting op verdedigings werken (planting on defense works),[5] offers the most complete and comprehensive account on the subject, although it is quite general it will function as the background knowledge of my analysis.

1 Programma nieuwe Hollandse waterlinie, “UNESCO”, programma nieuwe Hollandse waterlinie, accessed on: April 1, 2022, https://www.programmanieuwehollandsewaterlinie.nl/unesco/

2 Caroline Bugter, Loes van der Vegt, Kirke Mulders, Roland Blijdenstijn, Chris Will, Jeroen Bootsma, Menno Smit, Joost Findhammer, Henk de Jong & Eddie Poppe, “Dutch water defence lines UNESCO: Significant boundary modification defence line of Amsterdam”, December, 2018, 1-2, https://www.programmanieuwehollandsewaterlinie.nl/bibliotheek/documenten/documenten-unesco/

3 Bugter, van der Vegt, Mulders, Blijdenstijd, Will, Bootsma, Smit, Findhammer, de Jong & Poppe, Dutch water defence lines UNESCO, 98, 128, 142, 144, 158, 165 & 216

4 Chris Will, “Sterk water: de Hollandse waterlinie”, (Utrecht: Uitgeverij Matrijs, November 2002)

5 Martijn Boosten, Patric Jansen & Ido Borkent, “Beplanting op verdediginswerken: geschiedenis, beheer en praktijkvoorbeelden”, (Utrecht: Uitgeverij Matrijs, 2012)

Panorama Krayenhoff is a broadly supported vision for the execution of the national project: de Nieuwe Hollandse waterlinie (national project the New Dutch waterline). [6] Its introduction and summary probably explain in the best way why the historic value of elements like vegetation has not been assessed: the area the NDW covers is extensive, the time needed and the amount of parties involved make it a very extensive project, for this reason the level of abstraction is quite high. It is the task of the five provinces that the line covers to lower this level of abstraction and to translate this into concrete actions and interventions.[7] While one might argue that for a successful UNESCO nomination a certain level of detail should be guaranteed to successfully preserve the heritage, yet one might also conclude that it is being put into the hands of lower governments, and simply done at a later stage.

The greatest challenge of the UNESCO nomination is that the defense line needs to be preserved, and since the NDW has been hidden as much as possible making it accessible and inviting while also preserving its inherent qualities is a very complex task they might even be opposites. Understanding the landscape, and its different elements could help create a narrative to guide this preservation and revitalization effort. To make an attempt at filling the biggest gap found in the nomination report this thesis will try to assess the historic value of the vegetation of the NDW looking at one case study: fort Rhijnauwen. Investigating this underexposed facet of the defense line could strengthen the story of the place as mentioned by Gerdy Verschuure-Stuip,[8] she argues the story of the place could play an important role for designers but also policy makers in making decisions around these sites. To draw a meaningful conclusion from the analysis of the case study, and relating the outcome closer to this theory the next chapter will discuss the foundations of the story of the place: Genius loci, as defined by Christian Norberg-Schulz[9]. In an effort to contextualize the concept and interpret the analysis of the case study. This will be followed by a general history of the NDW, and the specific sub district of the case study, this to keep the analysis as close to vegetation as possible. The thesis will continue by dissecting the term landscape, and its various elements. This forms the basis for the case study of fort Rhijnauwen.

6 Erik Luiten, Joost van Hezewijk, Ed Joosting Bunk & Peter P. Witsen, "Panorama Krayenhoff: Linieperspectief", (Utrecht: de Eendracht, maart 2004) 8-9

7 Luiten, Hezewijk, Joosting Bunk & Witsen, Panorama Krayenhoff, backcover

8 Gerdy Verschuuren-Stuip, "The story of the place: Different types of stories of a place, the Netherlands", July, 2014, https://www.researchgate.net/publication/269775041_THE_STORY_OF_THE_PLACE_DIFFERENT_TYPES_OF_STORIES_OF_A_PLACE_THE_NETHERLANDS

9 Christian Norberg-Schulz, "Genius Loci: Towards a phenomenology of architecture", 1980

1. Genius Loci

As mentioned in the introduction this chapter will serve as backbone to the conclusions derived from a later analysis. In order to do this, this chapter will interpret the term genius loci as defined by Schultz.

Genius loci, or literally the spirit of the place has existed as a term to interpret 'places' ever since the Romans. A recent comprehensive interpretation of genius loci is given by Norberg-Schultz, who invokes Heidegger to support his interpretation and gives us contemporary examples that use the same line of reasoning like Lynch. Schultz divides genius loci respectively into 'character' and 'place'. Two terms that are hard to be defined and abstracted by scientific terms, this understanding of the words lead him to the phenomenology of Heidegger, or as he states himself: "return to the things, instead of abstractions and mental constructions".[10] Schulz's definition of place finds itself grounded in meaning of dwelling, a simple google search will answer this question to be: "a house of place to live in".[11] Heidegger pulls this apart by describing dwelling as the way humans are on earth, [12] the acceptance of this notion by Schultz means places are not only man made, but can in fact also be nature since Heidegger implies anything between the earth we walk on and the sky we look at is in fact a place.

The difference between the 'natural' and man-made landscape is hard to distinguish in the Netherlands. Most of the landscape shows traces of human intervention, making it cultural landscape. Schultz clearly inspired by Lynch states that the man-made landscape consists of: settlements, paths that connect them and various elements that transform the natural into the cultural landscape, he continues by describing the loci, moving away from the word place, as organically connected to the environment. [13] these elements are reminiscent of Lynch's denotation of the environment: district, path, border, node & landmark. And thus, although it is speculation, Schultz probably also agree with Lynch's reading of genius loci: "A good environmental image gives its possessor an important sense of emotional security. He can establish an harmonious relationship between himself and the outside world."[14] Schultz finishes his definition of a place by comparing the concentration and enclosure between the build and natural environment, concluding the methods are the same, but only its ingredients are named differently: floor, wall and ceiling or; ground, horizon and sky.[15]

10 Norberg-Schulz, "Genius Loci", 8
11 "Dwelling", Cambridge dictionary, accessed on April 5, 2022, https://dictionary.cambridge.org/dictionary/english/dwelling
12 Norberg-Schulz, "Genius Loci", 8
13 Norberg-Schulz, "Genius Loci", 10-11
14 Kevin Lynch, "The Image of the City", (Cambridge: The MIT press, 1960), 4
15 Norberg-Schulz, "Genius Loci", 11 - 13

Genius, or when reading Schulz: character, is much less tangible which is probably why Gerdy Verschuure concluded in her paper, on the use of the genius loci as vector for revitalization more research was needed.[16] The Character of a building or place is often a large part of the experience, courtyards feel protected, a factory feels practical and a library feels solemn. In each of this instances the character of the building plays an important role in how it is perceived, in architecture this is can be divided into two elements: the first being the cultural aspect, where the function of a building comes with certain traditions or rituals which is not intangible but is hard to analyze when one is not from the place in question, misinterpretations are waiting to happen and the second being the mode of production of the building, illustrated by Schultz in terms of motifs which gain meaning. These motifs are created by compositional elements like windows, doors of roofs.[17] These make the local character visible, an example that comes to mind is the typical wooden facades of Broek in Waterland, the Parisian sandstone buildings with zinc roof-cladding or wooden huts in Tirol.

Analyzing the organization of the man-made world one might conclude 'we' give meaning to a place by focusing the attention, on different scales: country, province, town, building, room. The smaller the more tangible the place gets, yet its character can be determined throughout different layers of scale and in different ways. Something which is highly applicable to the NDW seems and which what also, in hindsight seemed to be the motive of Gerdy to write about the story of the place is that Schulz explicitly states that (landscape)architecture has can make a site into a place by discovering its hidden potential meaning, by understanding, complementing and symbolizing the nature of the site.[18]

Concluding the most comprehensive way to put it would be that a place always contains numerous layers, some tangible, and some not at least not right away. When more layers are uncovered and decoded, the more the notion of genius loci or the spirit of the place starts to live.

16 Verschuuren-Stuip, The story of the place, 4
17 Norberg-Schulz, "Genius Loci", 15
18 Norberg-Schulz, "Genius Loci", 17 - 21

2. History

Origin — The history of the defensive use of water is extensive, especially so in a country with an abundance of it. Its use can be traced back to the roman limes. But since the history of the NDW serves only as a backbone for further research the focus will only go towards its own history. The NDW stretches from Muiden to the Bieschbos, which is approximately 85 km.[19] It was commissioned to replace the old Dutch waterline (ODW), and was envisioned by Napoleon Bonaparte and Cornelis Rudolphus Theodorus Krayenhoff, its construction took place between 1815 up until 1940.[20] In figure 2.1 can be seen how the NDW diverts from the ODW in an effort to protect the city of Utrecht. After the second World War the strategic value of the NDW was negligible, nonetheless during the Cold War the Ijssel line was constructed located much farther east,[21] interestingly this was the original plan by Napoleon and Krayenhoff which later changed to follow the start and end of the ODW. With the basest general knowledge one can delve into its development trough time. The development can roughly be divided in 6 periods, these maps and descriptions have been based on the book Sterk water by Chris Will.[22]

Period I. — After the decision to alter the Old Dutch Waterline (ODW) the first building phase ran roughly from 1815 till 1826, its activities include the reinforcement of existing structures on the NDW which formerly belonged to the ODW. Comparing figure 2.1 and 2.3 one can conclude new structures are constructed only around the city of Utrecht which makes sense since it's the main new area of interest that is protected.

Period II. — the second building period jumpstarted by after the Belgian revolt when the Netherlands started to see Belgium as a sovereign state, this second active building period took place between 1841 and 1864. In this period many fortresses were constructed along river dikes, these rivers are: Lek, Linge, Waal and Vecht. These new fortresses were all build in the tower fortress (torenfort) typology. As is clearly visible in figure 2.3 this second period is the largest addition made since its initial construction. Arguably more important for the landscape was a new law the 'kringenwet'. This law placed restrictions on what could be built around the fortresses it had three tiers: 1: outside a radius of 300 meter there could only be built with permission from the ministry, and with permission one was only allowed to construct with wood.[23] 2: the second tier applied to structures outside of a

19 Will, Sterk water, 53
20 Will, Sterk water, 55
21 Rita Brons & Bernard Colenbrander red., "Atlas Nieuwe Hollandse Waterlinie", (Rotterdam: Uitgeverij 010, 2009), 28-29.
22 Will, Sterk water, 154 – 166.
23 "Staatsblad Koninkrijk der Nederlanden 1853, No. 128" (s'Gravenhagen: Algemene Landsdrukkerij, 1853)

Figure 2.1. Building phases of the New Dutch Waterline

Figure 2.2. 'Verboden kringen'

radius of 600 meter, there were restrictions for using stone and the height of buildings.[24] 3: the last tier was for structures further removed than 1000 meter, no real restrictions for buildings were proposed but buildings could be emptied when there was military threat.[25] Furthermore, there were restrictions planting and water regulating measures, to respectively keep an open field and not temper with the inundation. This law has held back the growth of Utrecht for a long time, as seen in figure 2.2 the city is completely walled off, meaning no expansion was possible in the eastern direction, and vegetation was regulated by the military.

Period III. — The evolution of military equipment created the necessity for stronger reinforced fortresses, this due to the towed artillery used in the French German war, invented in 1860[26]. Since these new weapons have a much longer-range Utrecht and Naarden fall right in the frontline, as seen in figure 2.3 the inundation has the smallest width here, making it the Houtense vlakte a weak spot, thus new defenses further east need to be constructed. This takes place between 1867 and 1870.

Period IV. — History repeats itself, and sometimes in very short amounts of time. Due to technical advancements the revised fortresses of the NDW are now outdated and no match for the new mortars and grenades, this calls for a new period of renewal between 1870 and 1886. Looking at figure 2.3 this period might be the least interesting, it is important to note most of the constructions took place at existing fortresses in the form of fortifying and building bomb shelters.[27]

Period V. — The fifth period shows the strategic decline of fortresses, from 1914 the role of the fortresses was reduced to supporting infantry. Additions to the NDW in the period between 1914 and 1918 consist of building group shelters known as kazematten, construction trenches reinforced by concrete, new defense works constructed in this period included shelters. Some works became strategically unimportant, these were decommissioned. In figure 2.3 clusters of these group shelters have been added to the line.

Period VI. — The last period runs from 1939 – 1940 and focused only on strengthening the existing structures, and adding more group shelters. Since the addition of these shelters was not done in clusters in this period figure 2.3 shows no difference, after this last period the NDW was decommissioned due to its tactical insignificance.

24 "Staatsblad Koninkrijk der Nederlanden 1853, No. 128" (s'Gravenhagen: Algemene Landsdrukkerij, 1853)
25 "Staatsblad Koninkrijk der Nederlanden 1853, No. 128" (s'Gravenhagen: Algemene Landsdrukkerij, 1853)
26 Will, Sterk water, 69 - 70.
27 Will, Sterk water, 75 - 81.

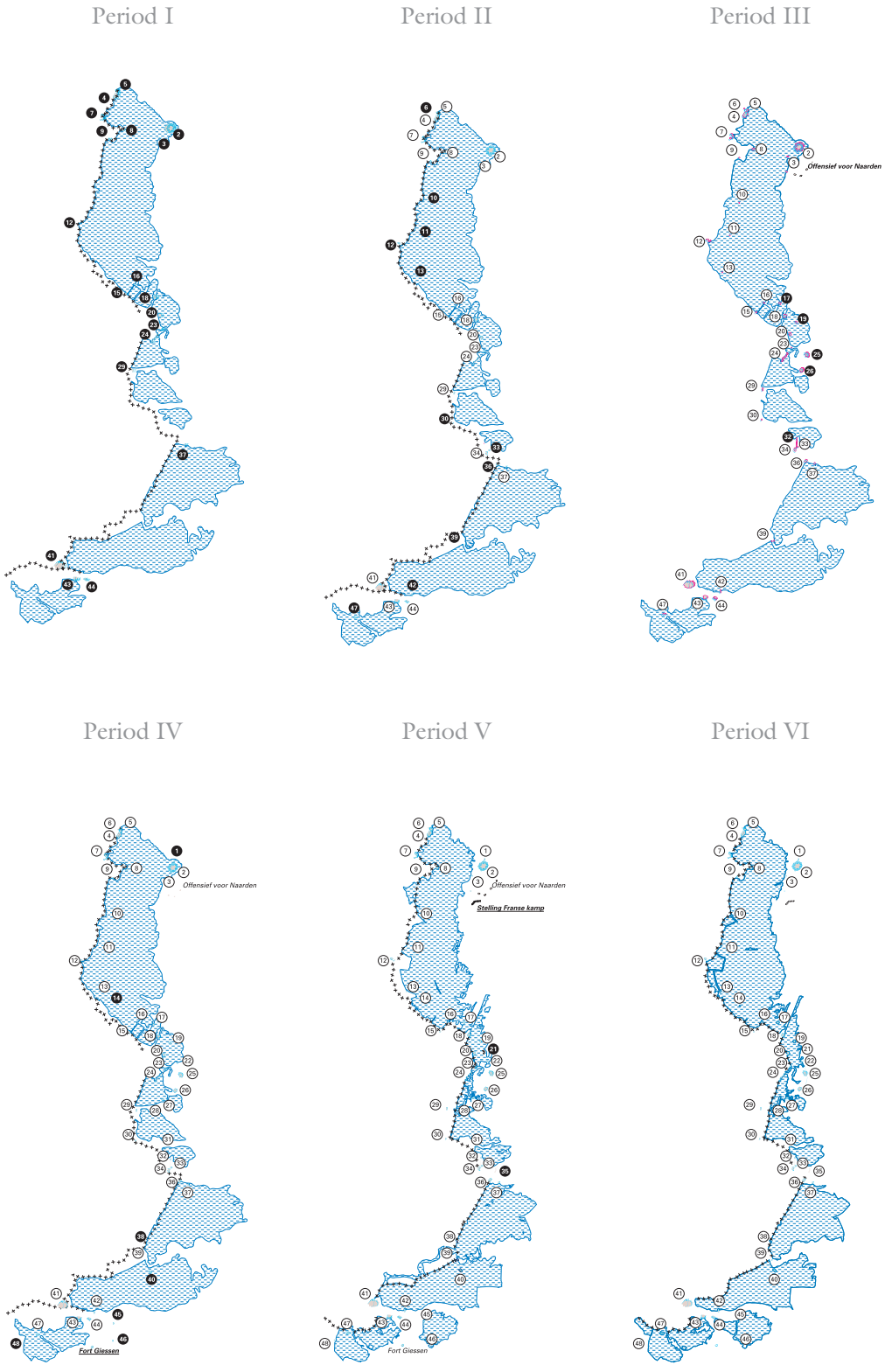

Figure 2.3. Building phases of the New Dutch Waterline

3. Landscape

This chapter serves the purpose of giving a stricter definition to the word landscape, its different elements and their role within the defense line. Most emphasis will be put on military planting since this is also the key aspect analyzed in the next chapter. The basis will be formed by the earlier mentioned books by Chriss Will, Marijn Boosten with additions where necessary.

The workings of the NDW rely heavily on the existing polder structure and the infrastructure that regulate the water. The system works exceptionally well because the infrastructure to make the polders dry can largely also be used to inundate them.[28] A notable weakness in the defense line is: 'de Houtense vlakte', as mentioned in the previous chapter its relative height makes it nearly impossible to inundate, to circumvent this problem additional fortifications were constructed. As discussed in the previous chapter the NDW was brought into existence to replace the ODW, adding the city of Utrecht behind the line, with that in mind it seems funny that the weakest point in the line lies exactly around this area due to its morphology. To give a sense of scale of the inundations, the NDW stretches from Muiden to Gorinchem, approximately 85 kilometers. The inundation would stretch along the line with an average width of 5 kilometers, and although the Dutch landscape can be perceived as rather flat figure 3.1 clearly shows the height differences which meant the inundation could not be made possible with a single water level. Instead the inundation was divided in 9 segments each with their own level. As shown by looking at figure 3.1, 3.2 and 3.3 one can conclude that these segments are logically based on their relative height, but also the administrative borders that divide the land invisibly.
The workings of the inundation system are too expansive too summarize in this thesis, speaking of the civil technical side. But its general use was quite simple. In times of threat the water level would be brought to a higher level, just at the edge of the rivers crossing the polders. This made the land already quite moist and unusable for farmers, they and their cattle would already be evacuated. The next phase was an inundation on a lower level than was ideal, during this phase many of the roads inside the polders remained usable, the last phase would be full inundation with a depth varying between 30 and 60 centimeters; too shallow for boats and too deep to cross by foot or horse.

28 Will, Sterk water, 83

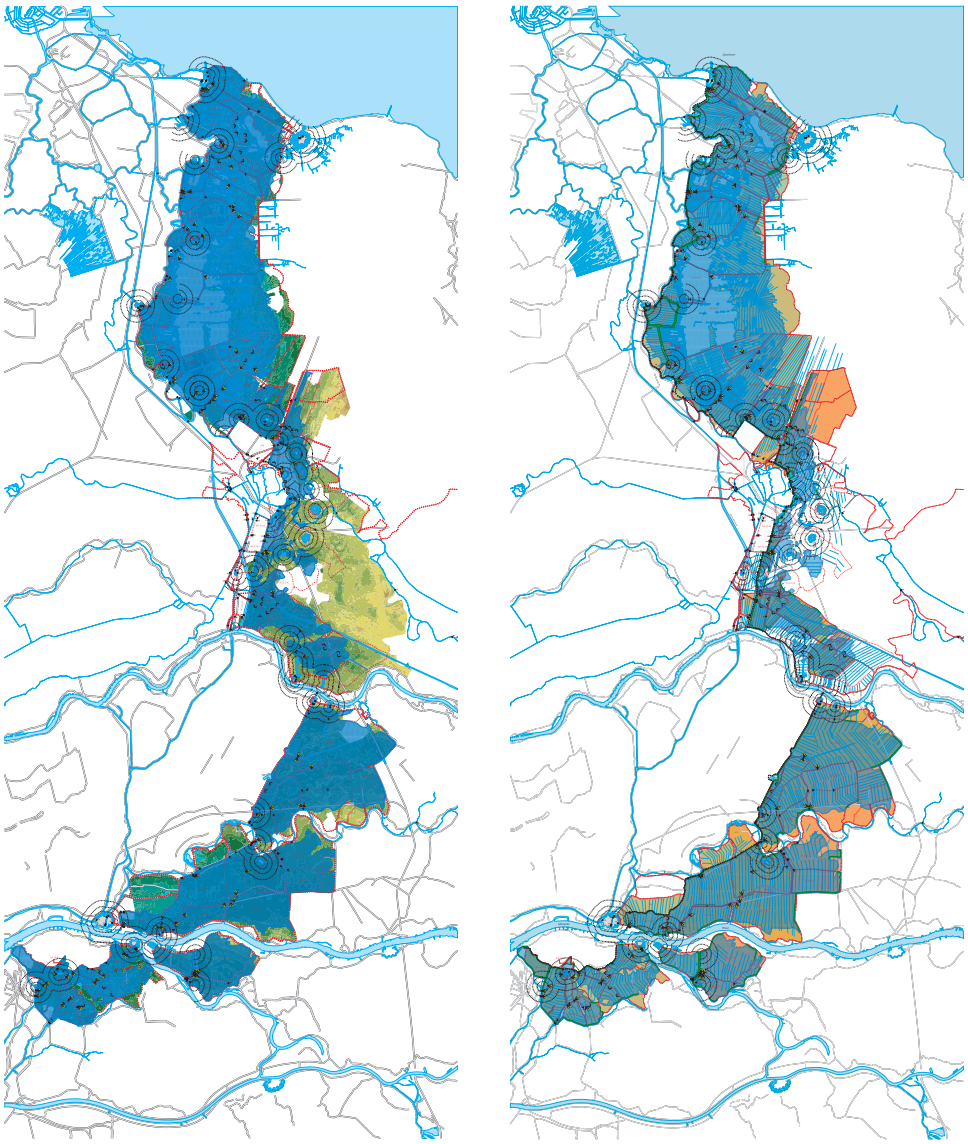

Figure 3.1. (Left) Height of terrain

Figure 3.2. (Right) Inundation polders

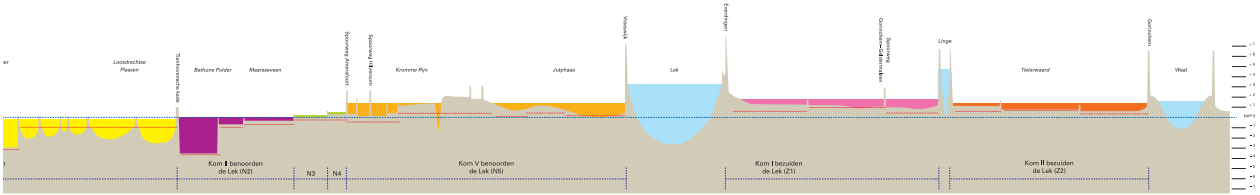

Figure 3.3. Diagram section of the nine inundation segments and their relative height

The NDW is a military defense line, which uses water as its main defender, that is why it is often used as a narrative for research and even developments. Where the morphology of the landscape and the workings of the water are intrinsic connected to each other the planting on along the line, and its defensive structures is a totally separate layer, more closely related to camouflage than the actual workings of the defense line, that is at least what one would think.

Most attention for this military use of vegetation was between the 16th and 18th century, when construction began on the NDW in the 19th century. The parts that were reused form the ODW were already fashioned with military planting since they were constructed between the 16th and 18th century, at the start of the construction of the fortresses that would connect the reused parts of the ODW along the NDW, most fortresses were still being adorned with planting as prescribed by Bélidor in 1734,[29] in specification drawings found in the archive of the Menno van Coehoorn stichting many plants are indicated: thorn hedges; pollard willow; wood for fire: oak, ash, alder, maple and willow; permanent trees: maple, chestnut, horse chestnut, elm, poplar, oak, American oak, linden, white willow& spruce and prunus bushes.[30] The reason for these plantings as found in Bélidor's La science des ingénieurs is most notably: to function as a threshold (hedges with thorns), protection against erosion, supply for fire wood, supply for wood for other utilities and reinforcement when earth walls endured enemy fire.[31]

With the appearance of today's camouflage, the link is easily made, but wars were different in the 19th century and only in the second half of the 19th century was planting actually used to camouflage the defense line, while it also gave ground soldiers cover, the term three mask (boom masker), can be traced back to this use. Much later there have also been tests for camouflaging against aerial sighting in 1932.[32]

29 Boosten, Beplanting op verdedigingswerken, 53

30 Martijn Boosten & Patrick Jansen, "Quick scan historische waarde van de beplanting op de Nieuwe Hollandse Waterlinie", (Wageningen: Janurary, 2017), 15

31 Boosten & Jansen, Quick scan historische waarde van de beplanting op de Nieuwe Hollandse Waterlinie, 15

32 P.J. Stuitje, "Correspondentie voor beplanting tegen luchtwaarneming en de bouw van 11 schuilplaatsen, 1 kazemat en 1 commandopost en voorbereiding voor andere werken t.b.v. het "Werk aan de Groeneweg"", 1932, https://adlib.coehoorn.nl/Details/fullCatalogue/100026305

Using vegetation as camouflage was thus never its first intention, yet using vegetation each group of plants had its own function much like the way they had when they were more seen as a utility. High trees were meant to hide military structures, and the damage enemy artillery did. Lower planting like Pollard Willows were used to hide friendly canon fire, keeping in mind that the cannons still needed a clear way to fire. Behind the cannons planting made sure that the cannons wouldn't be spotted because of the dark background the preference were trees with dark leaves such as elm trees.[33] Most of the outer rim of the fortress was planted with bushes to hide soldiers, but also to patch 'holes' in the camouflage that was created by the trees.[34] These holes were often caused because trees could betray the fortresses location from a large distance, thus planting them was done with care. In some parts of the defense line this was circumvented by planting lanes of trees outside the fortress complex itself, masking its location from a distance.

In 1908 there was a new document containing guidelines for maintenance and the realization for new planting. Before this document called: Algemeen stelsel van beplanting voor de permanente verdedegingswerken in de Nieuwe Hollandse Waterlinie (General system of planting for the permanent defensive structures along the New Dutch Water line) planting and maintenance was often different for each administrator. The new document as contained specifications for how much planting could hinder friendly fire, and the view from the structures resulting in the loss of a lot of vegetation. During the First World War it became evident the NDW had lost much of its tactical advantage due to the new weapons and the advent of the airplane.[35] Maintenance becomes focused on cost and a lot of the planting is removed. After the Second World War the tactical value of the NDW was nearly depleted,[36] and thus also the tactical value of the plating. Some of the planting was cleared altogether where other in other instances the maintenance simply stopped.

33 Boosten, Beplanting op verdedigingswerken, 57
34 Boosten, Beplanting op verdedigingswerken, 59
35 Boosten, Beplanting op verdedigingswerken, 61
36 Boosten, Beplanting op verdedigingswerken, 65

4. Fort Rhijnauwen

The case study chosen is fort Rhijnauwen, the biggest fortress in the defense line, after the line was decommissioned Rhijnauwen was hermetically closed off to the public, making it an interesting case study when it comes to the vegetation.[37] The analysis of the fortress will be conducted by looking at original plans and drawings. After establishing a clear view if the original design it will be compared to historic and more recent pictures after which there will be a reflection on the historic value of the vegetation on fort Rhijnauwen, and its value for the story of the place.

As told in chapter two, the Houtense vlakte was seen as the weakest link, resulting in secondary row of fortresses constructed in front of it. Fortress Rhijnauwen has been designed after the fortresses that were used for the defense line of Antwerp.[38] Six design proposals were made to get to the final product, build in fashion of the Prussian fortresses, its characteristics classifying it as a Prussian fortress are brilliantly set out by Catherine Visser in: Atlas Nieuwe Hollandse Waterlinie.[39] For the purposes of this thesis however these will not be discussed in great detail, interesting fact are that Rhijnauwen is by far the vastest. This great scope makes it an interesting case study since there was more space to apply planting. Furthermore, does Rhijnauwen differ from its Belgian counterparts in the sense of appearance, in contrast to Briamonts fortresses around Antwerp is Rhijnauwen as hidden as possible. The fortress is the apotheosis of the NDW and Dutch fortress architecture for many reasons, but the most interesting is that it is the adaptation of a successful foreign typology, build with traces of 17th century Dutch fortresses,[40] and possibly even more interesting in style of Menno van Coehoorn; with earthen ramparts instead of stone walls.[41]

37 Will, Sterk water, 154 - 166
38 Brons & Colenbrander red., Atlas NHW, 186
39 Brons & Colenbrander red., Atlas NHW, 181 - 201
40 Brons & Colenbrander red., Atlas NHW, 186
41 Joep van Hoof, "Menno van Coehoorn 1641 | 1704: vestingbouwer, belegeraar & infanterist", (Utrecht: Uitgeverij Matrijs, 2004), 26 - 41

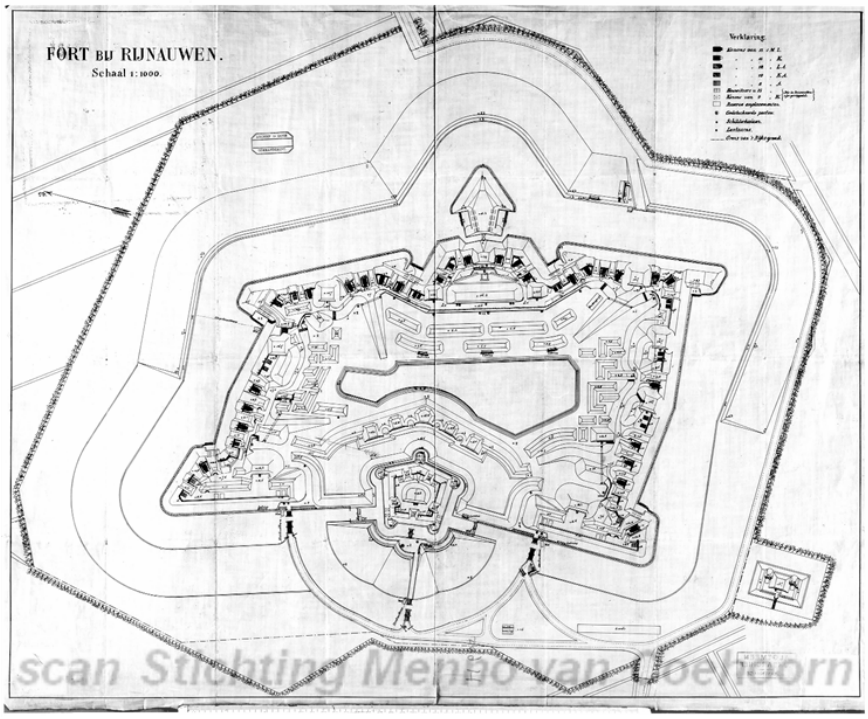

Figure 4.1. Detailed drawing of Rhijnauwen with indications of artillery from 1876.

Diving into the archival material in search for traces of vegetation figure 4.1 is one of the earliest finished design drawings, the drawing is quite schematic in the sense of landscape: water has not been indicated, there are no indications of height, and on the fortress island there no indication of vegetation. One element however has been meticulously drawn around the ensemble, a screen of trees which aligns with Boosten's theory that some fortresses were given a screen to make the planting around the tress less obvious.

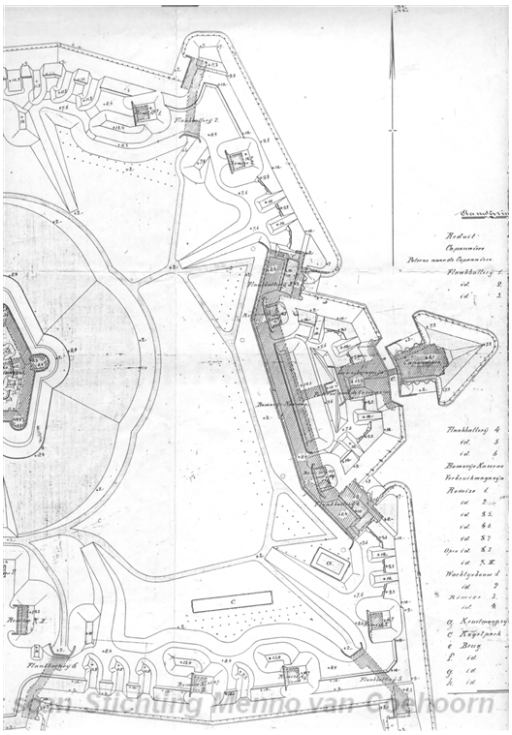

Figure 4.2. Detailed drawing of Rhijnauwen showing individual trees from 1888.

As mentioned in chapter 2 the fortress was built between 1867 and 1870, taking that in mind this drawing must be a bleed out of building period IV were many of the existing structures were fortified and were outfitted with additional bunkers.

This drawing (fig. 4.2.) however shows in greater detail, where the planting in the fortress was supposed to be placed, note the dots on the courtyard and the markings along the outline of the ramparts.

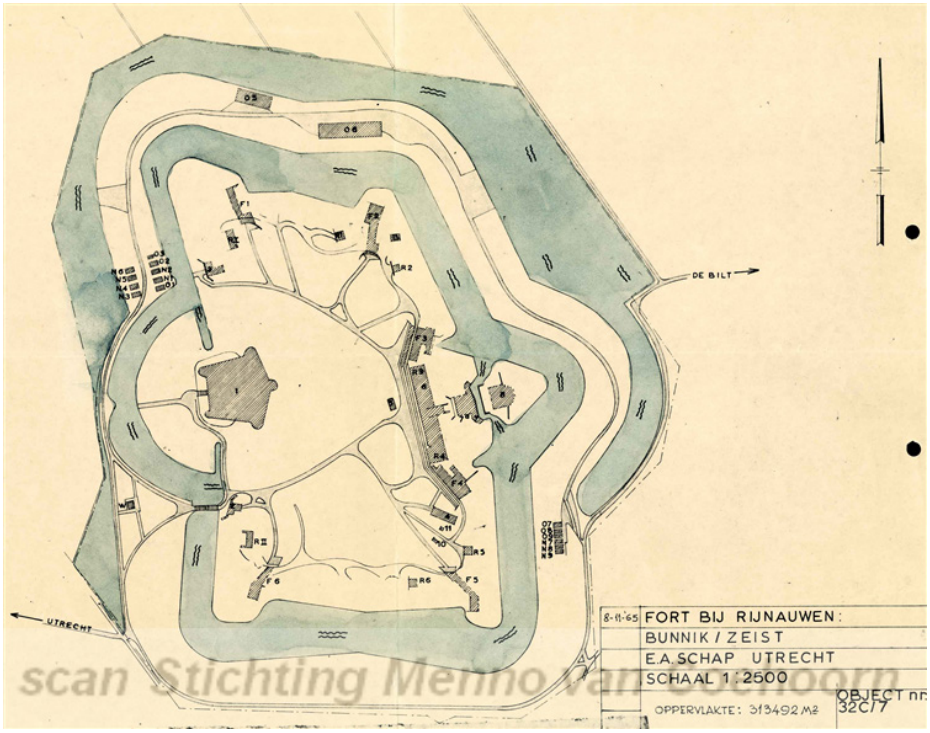

Figure 4.3. Fort Rhijnauwen drawing, more detailed towards water and orientation from 1965.

This quite recent drawing illustrates perfectly which narrative has always been used to describe and revitalize the NDW: water. Quite understandable considering it is the main source of its defensive capabilities, one is left to wonder though why no new narrative has been layered on top of it after the NDW lost its significance and was left abandoned for years.

Figure 4.4. Schematic design drawing showing a detailed view of the vegetation made in the 20th century.

This last drawing of the 20th century is the most detailed account of the vegetation around Rhijnauwen. Figure 4.4 is presumably made after the new planting guidelines were created in 1908 as mentioned earlier. Other than planting is this one of the few drawings where the slope of the ramparts is indicated, showing a more interest in the landscape. The full map sadly not available online has been translated into figure 4.5.

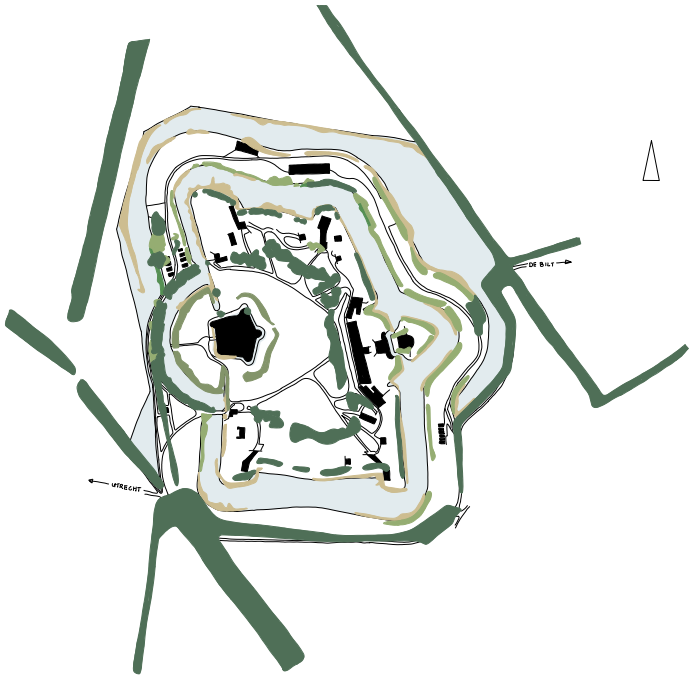

Figure 4.5. Map based on figure 4.4, with clear indications of vegetation (by author).

Trees
Bushes
Reed
Coppice
Low trees

The full drawing as seen in figure 4.5 shows all elements as prescribed by Boosten: trees that serve as background for artillery, lower vegetation to provide camouflage and obscure the artillery, and a screen of trees as seen in figure 4.1 to draw make the vegetation on the fortress stand out less.

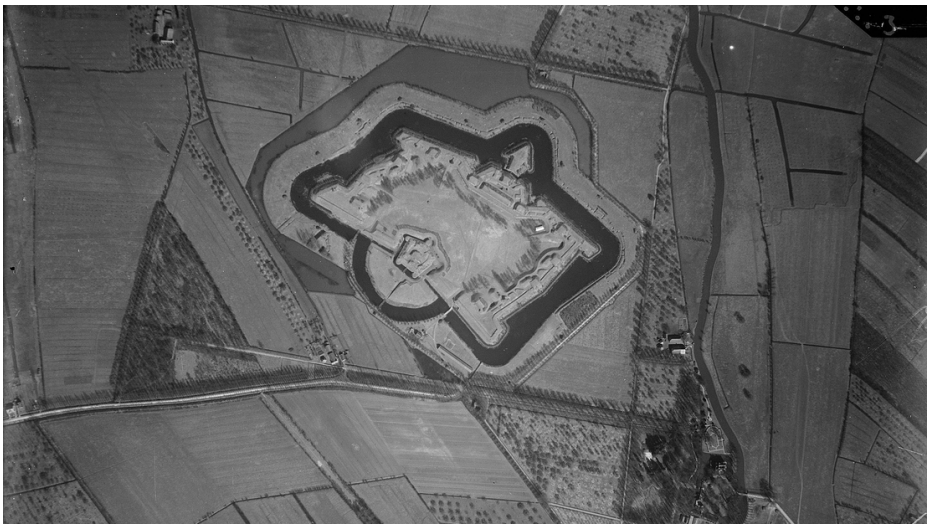

Figure 4.6. Aerial photograph of Rhijnauwen made between 1920 and 1940.

How interesting it must be then to compare figure 4.4., A paper reality with an actual image of Rhijnauwen from this time. Since the drawing is quite schematic in the way it only shows blots of vegetation, the most suitable photograph would be figure 4.6., An aerial made between 1920 and 1930, with roughly the same level of abstraction.

Upon inspection of figure 4.7, one the similarity is striking. Trees as would be expected are most readable, lower vegetation like pollard willows are distinguishable, but are readable because the information of figure 4.5. Is added. The reed seems like faded edges of the fortress. While much of the vegetation is visible some parts seem missing from the design, which are apparent in the aerial view, and vice versa. This discrepancy must be an artefact from the irreconcilable real world, and the paper reality.

With hesitation the conclusion however can be drawn that at least between 1920 and 1940, the real world matched the design, and literature as reviewed in the previous chapter. Meaning there was at least at that time historic significance to the planting, while as discussed in chapter two it was a period when the decline of its tactical significance was already set in motion.

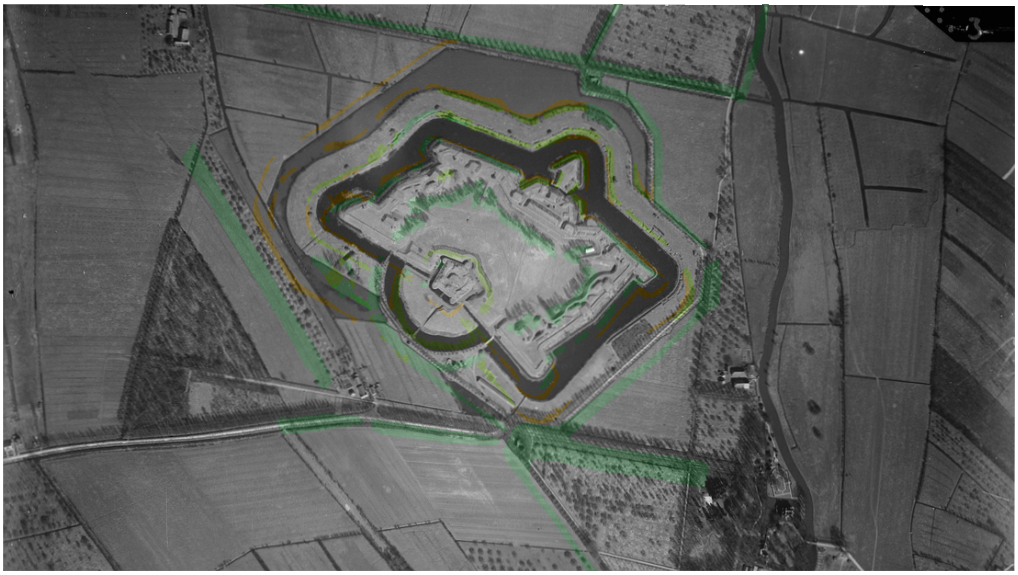

Figure 4.7. Overlay of figure 4.5 and 4.6.

From this hesitant and careful first conclusion it would be good to track this evolution through time, since the striking similarity between figure 4.6 and 4.7 the following observations will be done by comparing figure 4.6 with 4.8; 4.9; & 4.10.

Starting with figure 4.8. The first observation is that the vegetation has grown or jumps more into view, this might be because of the season the photograph was taken (summer instead of winter for example), but overall comparing the pictures most vegetation looks bigger in size, where some spots show signs of felling. Something unrelated but quite noticeable is the addition of bunkers as contrasting white spots to the fortress, indicating the concrete was quite new, and clean when the photo was taken.

Two decades later figure 4.9 was made by the ministry of defense, while its harder to compare because it is not a top down aerial view, what becomes clear from this photograph is that maintenance around the NDW was put on hold as became clear in the previous chapter. Due to the fullness of the vegetation the island almost looks crowded or full, an impression one wouldn't get from figure 4.6 or 4.8.

The las picture shows a quite recent scene, although more recent top down views were available figure 4.10 was chosen so the comparability between 4.9 and 4.10 is optimal. As told in chapter 3, Rhijnauwen was hermetically closed off when it was decommissioned, giving space to nature to thrive, and when one keeps that in mind comparing 4.10 and 4.6 that is indeed what happened. The outer ring is completely overgrown with trees, as you might remember should be low to accommodate friendly artillery. One effort was made to keep the spatial hierarchy intact, its traces are clearly visible; the courtyard is maintained, even mowed and trees do not seem to settle there, probably by human intervention. Concluding that much of the vegetation seems to be historically relevant, although I have no doubt that in the years of abandonment wild plants have also set foot on the fortress.

As far as these comparison goes the layers found in the landscape are still, very much traceable tying into the first chapter about the spirit of the place. The layers of vegetation start with the close by estate of Rhijnauwen build in the 13th century; it continues with the construction of the fortress itself, the adornment of the fortress with plants during its initial building period, and the revised scheme along the guidelines from 1908 and finally the (partial) end of maintenance of these green facilities, resulting in the place presented in figure 4.10. I do believe understanding these layers could help create a narrative for redevelopment of the fortress, since all of them are traceable and create a deeper understanding of the place.

Figure 4.8. (top) Aerial photograph of Rhijnauwen made around 1937.

Figure 4.9. (middle) Aerial photograph of Rhijnauwen made around 1959.

Figure 4.10. (bottom) Aerial photograph of Rhijnauwen made around 1999.

5. Conclusion & Discussion

This thesis was inspired by a gap in the UNESCO rapport that led to the successful nomination of the NDW as addition to the defense line of Amsterdam. By dissecting the term genius loci as defined by Schulz, the history of the NDW and the use of the landscape of the NDW boundaries were formed to analyze and interpret the (historic) value of the vegetation around the NDW.

In chapter four these boundaries and archival material synthesize into an analysis and interpretation of the vegetation around Rhijnauwen, the case study chosen because of the material that was available, the size of the fortress, and its current state.

The conclusion is that upon investigation of the vegetation on Rhijnauwen, from plans one drawing, presumably made when the planting was revised around 1908, gave enough information to make a decent diagrammatic map of its historic vegetation. This was compared with various aerial photo's trough time. Together with the previous chapters this resulted in an understanding of the evolution of the vegetation around the fortress, the meaning of these layers, and its current appearance.

When critically reflecting on the analysis itself one might conclude it could have been more thorough, when the question was posed: what is the historic value of the vegetation around fortress Rhijnauwen. The method of collecting archival drawings and photo's is presumably correct, what is missing in my own opinion is a detailed drawing, accompanied by photos that show the current state of the vegetation. This help to create context for the reader, and one could estimate the age of the plating to see for instance if much of the planting before the revision around 1908 is left.

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Images

Figure 2.1: by Author.

Figure 2.2: Canon van Lunetten. "Verboden kringen." n.d. Accessed from: https://canonvanlunetten.nl/1900/12/verboden-kringen/

Figure 2.3: by Author, based on: Brons, Rita red. & Colenbrander red., Bernard. “Atlas Nieuwe Hollandse Waterlinie.” Rotterdam: Uitgeverij 010, 2009.

Figure 3.1: Brons, Rita red. & Colenbrander red., Bernard. “Atlas Nieuwe Hollandse Waterlinie.” Rotterdam: Uitgeverij 010, 2009.

Figure 3.2: Brons, Rita red. & Colenbrander red., Bernard. “Atlas Nieuwe Hollandse Waterlinie.” Rotterdam: Uitgeverij 010, 2009.

Figure 3.3: Brons, Rita red. & Colenbrander red., Bernard. “Atlas Nieuwe Hollandse Waterlinie.” Rotterdam: Uitgeverij 010, 2009.

Figure 4.1: Stichting Menno van Coehoorn, 1876. Accessed from: https://adlib.coehoorn.nl/Details/fullCatalogue/100006509

Figure 4.2: Stichting Menno van Coehoorn, 1888. Accessed from: https://adlib.coehoorn.nl/Details/fullCatalogue/100011915

Figure 4.3: Stichting Menno van Coehoorn, 1965. Accessed from: https://adlib.coehoorn.nl/Details/fullCatalogue/100024641

Figure 4.4: Stichting Menno van Coehoorn, early 1900's. https://adlib.coehoorn.nl/Details/fullCatalogue/100015243

Figure 4.5: By Author

Figure 4.6: NIHM, Accesed from: https://www.rtvutrecht.nl/nieuws/1814546/in-beeld-historische-luchtfotos-van-de-provincie-utrecht

Figure 4.7: By Autohor

Figure 4.8: Stichting Menno van Coehoorn, 1937. Accessed from: https://adlib.coehoorn.nl/Details/fullCatalogue/100029880

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Figure 4.10: Stichting Menno van Coehoorn, 1999. Accessed from: https://adlib.coehoorn.nl/Details/fullCatalogue/100000241

Sjimmie de Jong
4882946